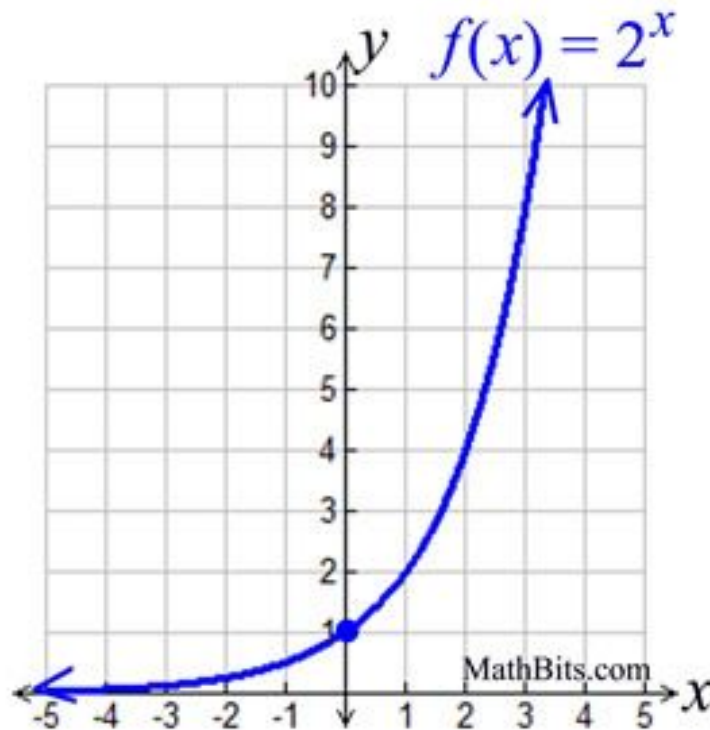


Systems And Problem Solving

By Thomas Park

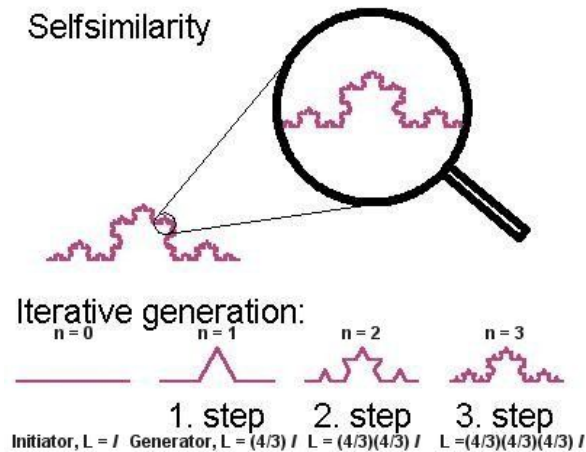


This is an exponential system. As we move from left to right, the y value (or vertical value) of the curve increases. As this is a non-linear relationship, the amount of increase from point to point depends on how far to the right we move. The curve sharpens as we move to the right.

If the x (or horizontal) value was time, the y result increases at a quicker and quicker pace as we move ahead.

A system like this is a good analogy for things that continue to increase at a faster and faster tempo. For example, as time progresses, the world population gets larger, and this happens with greater and greater rapidity.

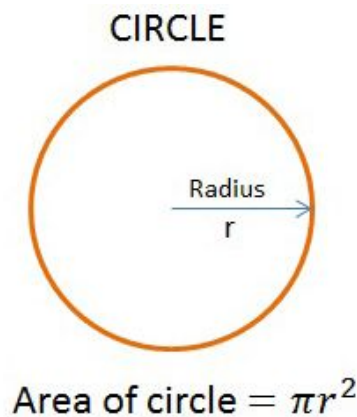
The only way for an open system like this NOT to increase exponentially is for the relationship between the x and y variables to change. Left unchecked, a system like this will only produce exponentially larger results.



A fractal system is one in which the result is established using a particular set of conditions. These conditions cause the system to create recursive “iterations”. The system puts results out that conform to particular patterns that never change and never stop.

We can see that the above graph depicts a system in which iterations of the same result are generated. If time is the x value, as time goes on, and x increases, only versions of the original result are created. And this continues indefinitely.

A fractal system is open, and the only way to resolve it is to change the conditions determining the y value.



In some ways, a circle can represent an open system. For example, traversing its circumference could go on forever, as a person would just go around and around. Also, the relationship

between its size and area, and other parts, is partially determined by a number we call "pi", which is represented by a decimal that continues forever without being completely determined.

That being said, the area of a circle is a limited quantity. Therefore, I think of it as a closed system.

If a person said, "How many people are there, right now, within 1 mile of here", that would describe a finite amount of people, and that amount could be represented by a number.

If an open, or a recursive, system could be changed into a closed, or finite one, that would provide a definite solution for the terms of the system, and the system would not continue unresolved.

This is in the world of mathematics, yes, but it applies to many kinds of systems and issues.

In the economy, a stock sell-off can be represented by an exponential curve. Only by changing the amount sold over time will this exponential reduction stop, and that must be done by changing certain conditions-- the ones that establish the x-y relationship (or others which similarly effect it). These might be things such as, for example: a change in the GNP, an international event, or, more than anything, the mood and tenor of the body of traders (and stockholders).

If one is involved with a fractal system, it may be that efforts are applied similarly, and similar patterns result, with no solution. For example, an argument or debate might recurse endlessly, if the two parties accept a closed set of conditions, and continue to similarly assert them. Only if the conditions are changed can the system resolve-- and for that to happen, in our example, the debaters would have to allow that their assumptions, the things they were continuing to assert, were not complete, and that new assumptions (or "conditions") could be accepted,

Not all systems should resolve, and not all should be closed. We would like, for example, for time to continue indefinitely (or for as long as is possible). Our food production should continue to keep pace with the population, if not to grow.

There are other systems which we would like to resolve. Perhaps a crisis causes a dramatic, exponential negative result. Or, maybe an disagreement goes on for too long, without being resolved. According to our mathematical analogies, the only way to remedy situations like these is to change the conditions themselves.

The way results are generated has to be reconsidered and changed- in some cases, materially or tangibly, and in others, attitudinally, in accordance with beliefs and assumptions used to create the original system.

